Process Improvement
Vision and Foundation

Paul Helgerson, MD

VAPAHCS Annual Retreat

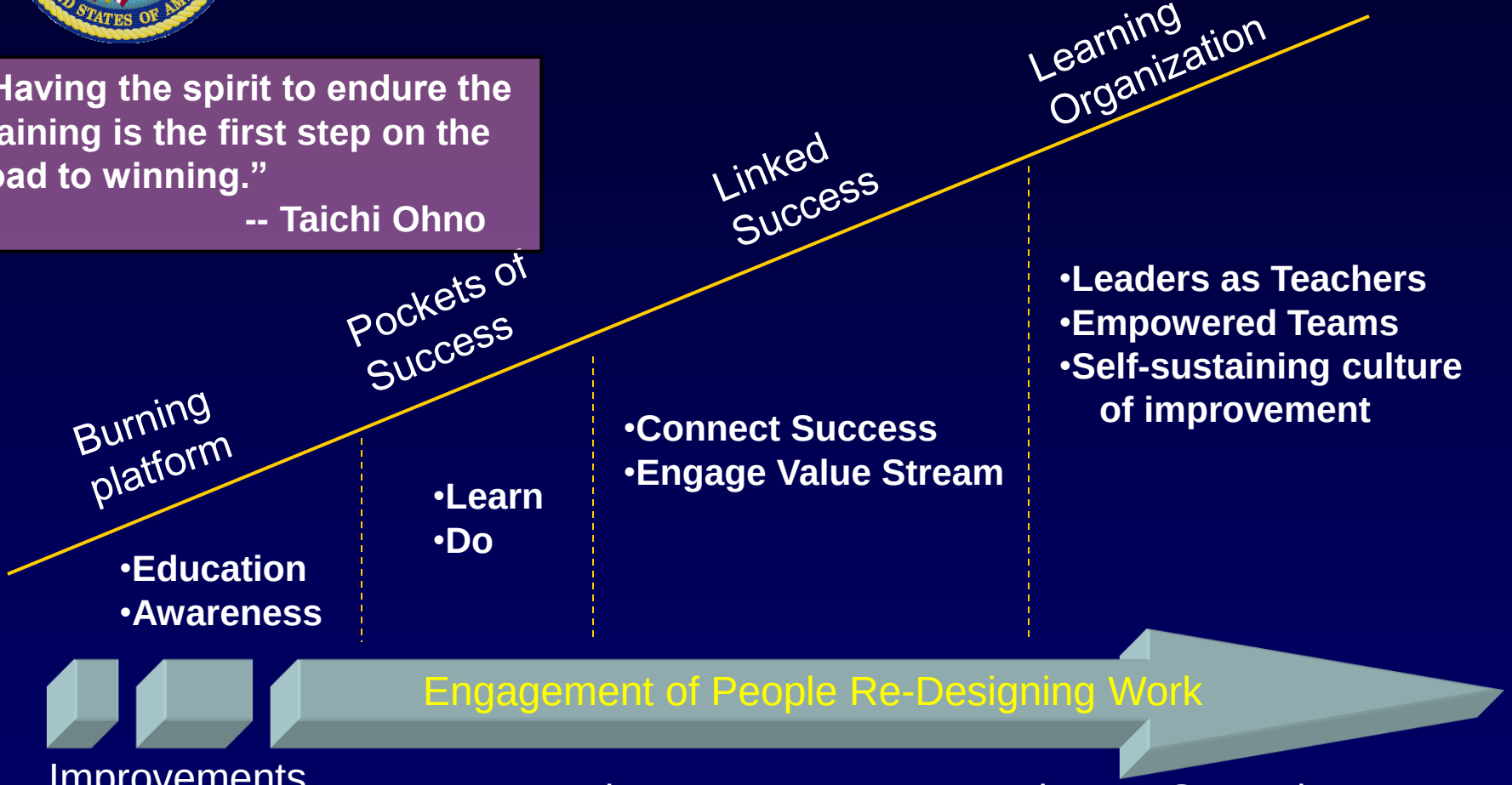
2/22/10

Objectives

- Build the case for Process Improvement
  - Need, Method
  - Address “Elephants in the Room”
- Discover foundations for change methodology
- Introduce a common framework for process improvement in the healthcare setting
- Update local opportunities

Systems Redesign Journey

"Having the spirit to endure the training is the first step on the road to winning."
-- Taichi Ohno



Slide Adapted from Boeing. Used with permission

Step One:
Identifying A Framework

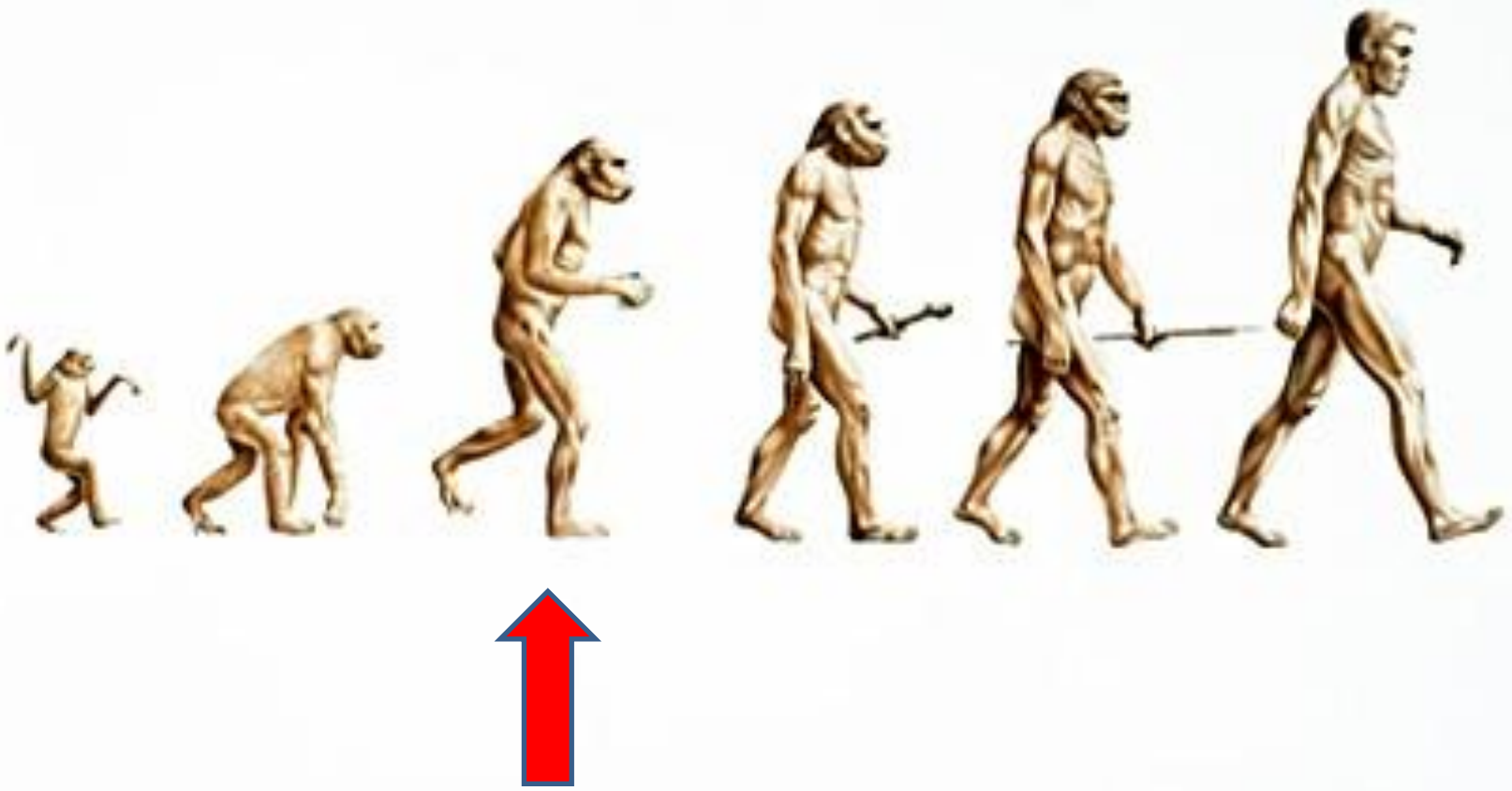
- Vision > Identify Values
- Analysis > Enumerate Priorities
- Team > Interdisciplinary, Front Line
- Aim > Direction, Leadership
- Map > Understand our Work
- Measure > Chart Progress
- Change > Active, Rapid Cycle
- Sustain > Plan for Lasting Effect

The Need – Framework

Exercise

Visualize the process of walking your dog in the rain…

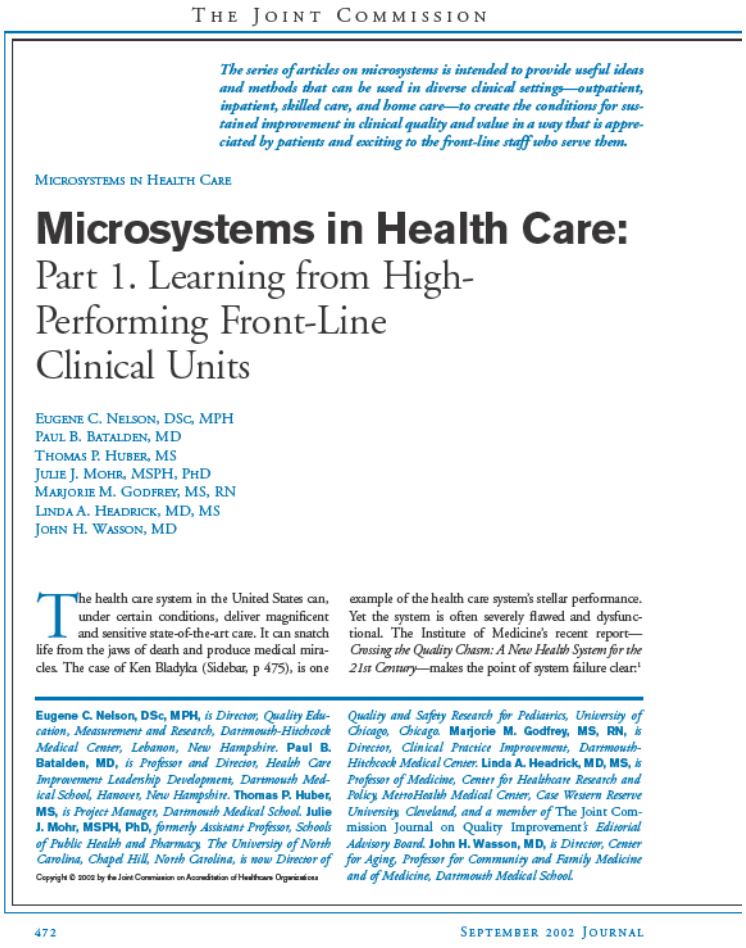
Phil Masturzo / AP



We Are Here

Dartmouth-Hitchcock

Clinical Microsystems



THE JOINT COMMISSION

The series of articles on microsystems is intended to provide useful ideas and methods that can be used in diverse clinical settings—outpatient, inpatient, skilled care, and home care—to create the conditions for sustained improvement in clinical quality and value in a way that is appreciated by patients and exciting to the front-line staff who serve them.

MICROSYSTEMS IN HEALTH CARE

Microsystems in Health Care:
Part 1. Learning from High-Performing Front-Line Clinical Units

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The health care system in the United States can, under certain conditions, deliver magnificent and sensitive state-of-the-art care. It can snatch life from the jaws of death and produce medical miracles. The case of Ken Bladyka (Sidebar, p 475), is one example of the health care system's stellar performance. Yet the system is often severely flawed and dysfunctional. The Institute of Medicine's recent report—*Crossing the Quality Chasm: A New Health System for the 21st Century*—makes the point of system failure clear.[1]

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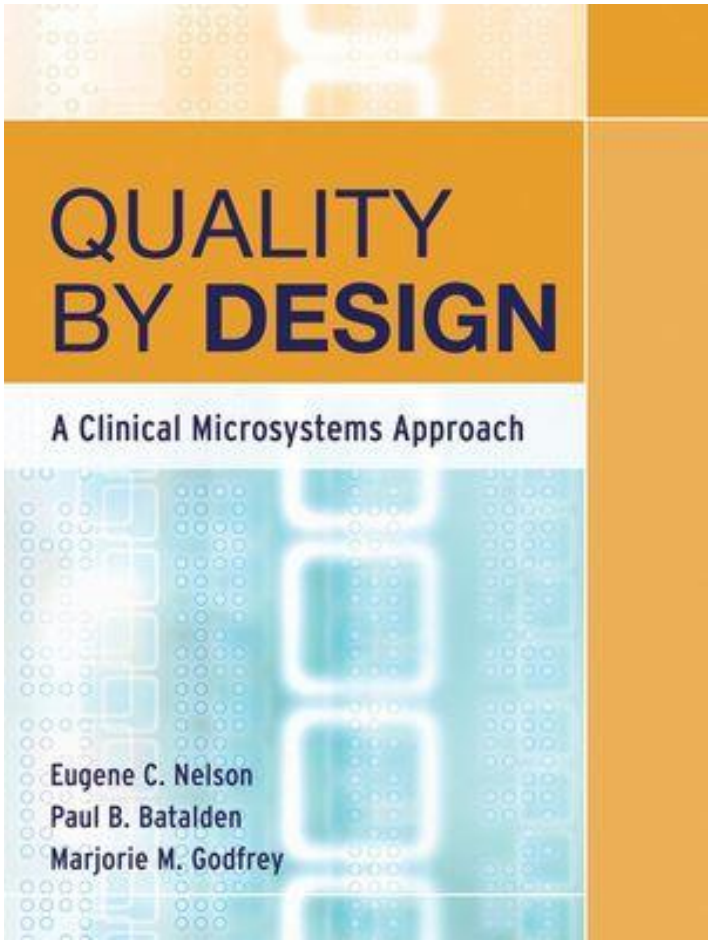

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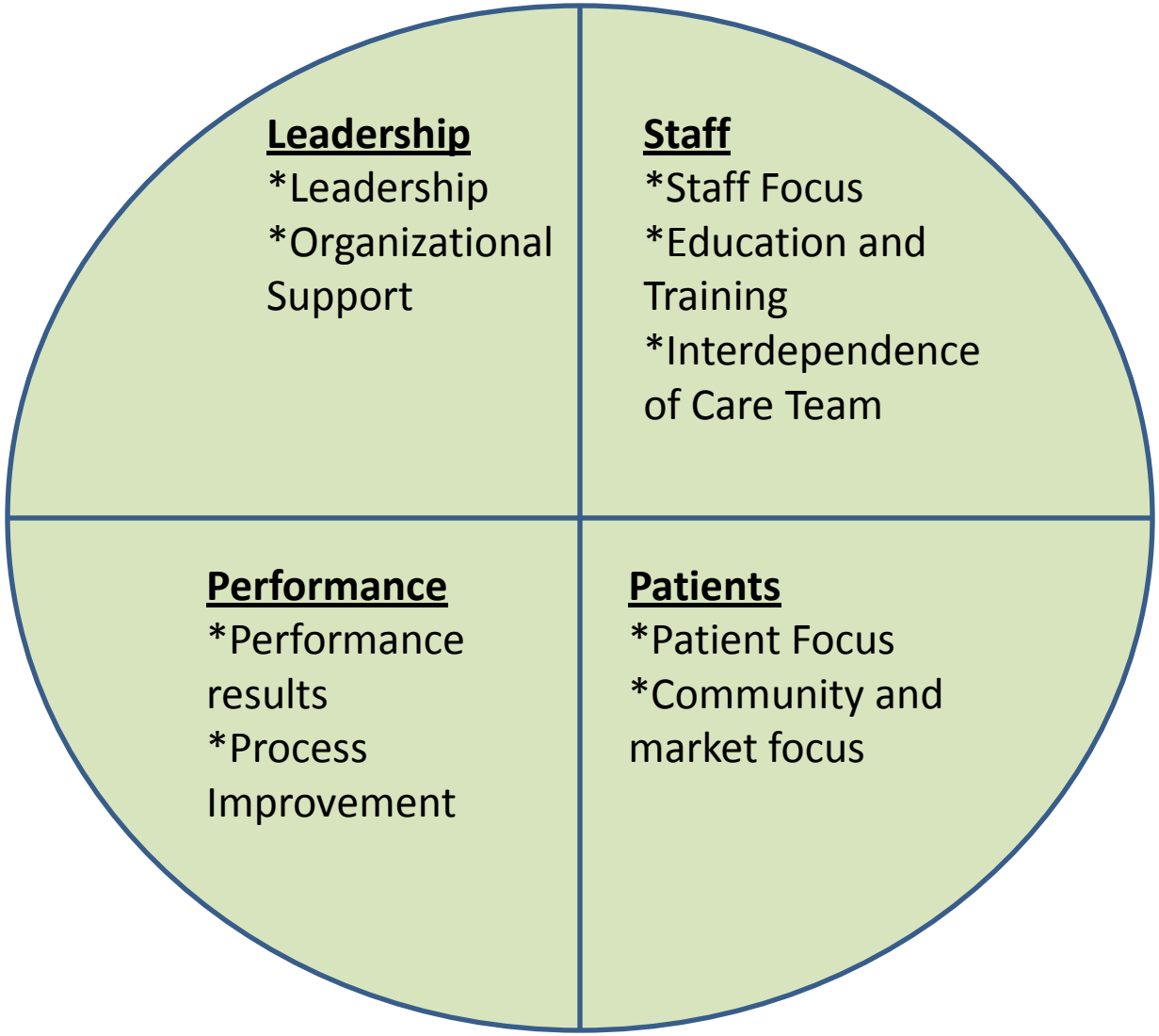
Clinical Microsystems



Source: Quality By Design, Nelson and Batalden 2007

Institute for Healthcare Improvement

The Collaborative Model

- Institute for Healthcare Improvement
  - Genesis of the Collaborative Model
- Best Evidenced Results/Validation of Method
- Precedent for Success within VA
  - Boston, Tampa, Nebraska/Western Iowa, San Francisco
- Longitudinal, Immersive, Flexible, Outcomes Based

Robert Wood Johnson Foundation

INSTITUTE FOR HEALTHCARE IMPROVEMENT

The Evidence Base of Change

JONA
Volume 38, Number 9, pp. 386-394

THE JOURNAL OF NURSING ADMINISTRATION

The Relationship Between the Volume and Type of Transforming Care at the Bedside Innovations and Changes in Nurse Vitality

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Marjorie L. Pearson, PhD, MSHS
Pat Parkerton, PhD, MPH
Tracy Yee, MPH

Through an initiative called Transforming Care at the Bedside (TCAB), the Robert Wood Johnson Foundation and the Institute for Healthcare Improvement have created an innovative bottom-up framework for redesigning the work environment on medical-surgical units. The specific purpose of this study, conducted by the University of California Los Angeles/RAND evaluation team, was to examine the number of innovations tested and the association of the volume of tests made and changes in a summary measurement of self-reported vitality at the 13 participating hospitals. The findings of this evaluation yielded several important implications for nurse leaders.

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Hospitals face a dual challenge: providing safer, patient-centered care and attracting and retaining nurses.[1] Nurse leaders have expended time and resources developing and implementing structural and process redesign strategies to improve the conditions of nurses working in the hospital environment.[2-4] Many of these redesign approaches have been leadership directed and lacked the full participation of frontline nurses and other care team members.[2-4]

Research has demonstrated a relationship between the level of nurse job satisfaction and empowerment factors in the workplace.[5-11] For instance, Magnet hospital research has shown that staff nurses prefer to work in hospital settings where they have the power to exercise their judgment and implement changes related to their work environment without having to go through a multilayered process.[7-9,12,13] Similarly, research on quality improvement has demonstrated the value of engaged frontline staff in developing and sustaining improvement, although much of this research has offered limited insight into creating and maintaining engagement.[14]

Launched in 2003, Transforming Care at the Bedside (TCAB) is a national program of the Robert Wood Johnson Foundation and the Institute for Healthcare Improvement (IHI) designed to engage leaders at all levels of the organization to improve the quality and safety of patient care on medical and surgical units, increase the vitality and retention of nurses, engage and improve the

Improving Communication Among Nurses, Patients, and Physicians

A series of changes leads to cultural transformation at a TCAB hospital.

By Kimberly B. Chapman, MS, RN, CNL

As health care providers try to accomplish more in less time, the relationships between patients and providers and among providers naturally suffer. Miscommunication, flawed assumptions, decreased staff and patient satisfaction, and poor or nonexistent care coordination result.

To Err Is Human and *Crossing the Quality Chasm*, reports from the Institute of Medicine, stress that good communication is critical to ensuring safe and reliable care.[1,2] The current challenge in health care is to create an environment in which open and transparent communication is the norm rather than the exception. One way to do this is by adopting strategies that have been successful in other industries. For example, crew resource management, a training program developed by the aviation industry and adapted to other workplaces, contributes to a team-centered approach by emphasizing shared decision making and interpersonal communication.[3] Using communication tools such as situation–background–assessment–recommendation (SBAR) communication ensures that messages are clear and unambiguous even in stressful situations.[3]

Another challenge facing health care organizations is attracting and retaining nursing professionals in an environment beset by rapid change and constrained resources.[4] At Wentworth-Douglass Hospital, a community, nonprofit acute care hospital in Dover, New Hampshire, our leadership grew concerned that new nurses were losing sight of their reasons for pursuing the profession and that experienced staff were disillusioned by processes outside their control, ranging from a fluctuating census and increased patient acuity to unreliable equipment and having to hunt for and gather supplies. As Donna Diers wrote, "Nursing is two things; the care of the sick (or the potentially sick) and the tending to the environment within which care happens."[5]

We recognized the importance of these challenges and felt that participating in the Transforming Care at the Bedside (TCAB) initiative could help us address them.

We formed a TCAB team of approximately 20 staff nurses, pharmacists, case managers, physicians, clinical coordinators, educators, and supervisors. The mission statement we developed was to establish a patient-centered healing environment with mutually beneficial partnerships among patients, families, and health care providers in a physically comforting area. Improving communication was critical to achieving this aim. Since becoming involved in TCAB in May 2005, we have implemented three major initiatives: moving the location of the change of shift report to the bedside, implementing the safety huddle, and establishing nurse–physician "intentional" rounds at the bedside.

A 28-bed medical–surgical telemetry unit, 3 North, piloted our tests of change. Staff members were task oriented rather than patient centered, there

Patient Jerry Howard (center) discusses her plan of care with William Danford, MD, and author Kimberly B. Chapman during nurse–physician intentional rounding at Wentworth-Douglass Hospital in Dover, New Hampshire. Photo courtesy of Rachel Bragg.

A Focus on the World Microsystem

- The Interdisciplinary Team
  - As an Improvement Working Group
  - As the Core Unit of Care Delivery
- Developing Leaders in Improvement
  - Methodologically Sound, Intrinsic to The Microsystem
- Improving Processes
  - Optimizing Value
- Improving Experience
  - …of Staff, and most of all Patients

Lean (Virginia Mason)

- Rigorous Approach to Defining Quality
- Disciplined, Unrelenting Approach to Process Improvement
  - e.g. 7 types of waste
- CULTURE of continuous, visible, integrated improvement

Q=A x (O+S)/W

The Virginia Mason Quality Equation

Components of **Q**uality

Appropriateness

Outcomes

Service

Waste (or lack thereof)

- Addresses all aspects of quality: link to vision
- Painstaking efforts to engage all team members
- Discussion of "Appropriateness" is provocative but high yield
- MD behavior hardest to change

Productive Ward

Domains of Improvement

- Shift Handovers
- Nursing Procedures
- Admissions and Discharges
- Well Organized Ward
- Knowing How We Are Doing
- Ward Rounds
- Patient Hygiene
- Patient Status at a Glance
- Patient Observation
- Meals
- Medicines

The Productive Ward

Domains of Improvement

- Shift Handovers
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- Patient Status at a Glance
- Patient Observation
- **Meals**
- Medicines

Ideas of Change

- Protected Meal Times
- Red Trays
- Standardized Preparation and Positioning

What *IS* Lean?

- Management Technique
- State of Mind
- Set of Practical Tools for Process Improvement
- ALL OF THE ABOVE

Lean Concepts

- Value
  - Value is determined by the “end customer” – the patient
- Identify and eliminate waste
  - Anything that does not add value from the patient’s perspective
- Value flows without interruption
  - Identify ideal patient experience – streamline process and eliminate waste to achieve
- Allow customer to “pull” value from process
  - Available when they want it – one piece flow
- Continuous pursuit of perfection
  - Reliable and sustainable systems design

The Seven Wastes

- Overproduction
- Incorrect Utilization of Staff
- Defects and Rework
- Waits/Delays
- Transportation
- Unnecessary Motion
- Excess Inventory

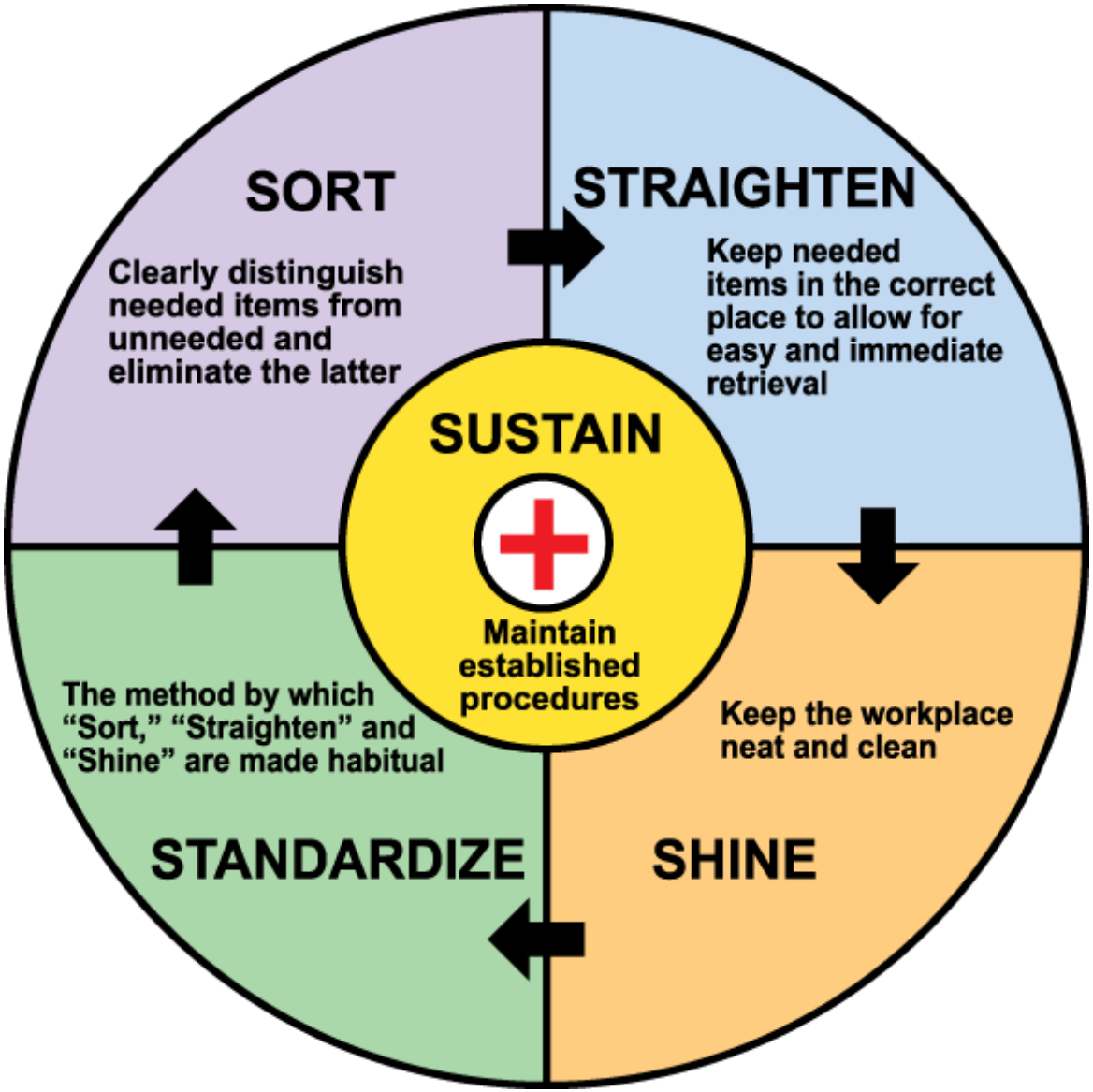
Examples of Healthcare Waste

How would you categorize these?

- Unnecessary Lab Tests
- Nurses as transporters, phlebotomists, ward clerks
- Trick Question: An ICU full of patients waiting for an acute ward bed

“Lean Tools”

5S


SORT
Clearly distinguish needed items from unneeded and eliminate the latter
STRAIGHTEN
Keep needed items in the correct place to allow for easy and immediate retrieval
SUSTAIN
Maintain established procedures
STANDARDIZE
The method by which "Sort," "Straighten" and "Shine" are made habitual
SHINE
Keep the workplace neat and clean

Why 5S?

- Initial IHI work: Nurses spend only 30 percent of their time in contact with patients. Number one distracting priority: looking for things on the unit.
- Initial Virginia Mason work: Hospitalists spend average of 2.4 hours/day looking for things – charts, patients, test results, family members, etc.

5S – Way More than Organization

Benefits of a Simple Project

- Places front line teams in charge of their working environment
- Reinforces concepts of types of waste
- Establishes standards, with involvement of staff
- Sends visible message to patients, others

Adapted from Tapping and Kozlowski, “Value Stream Mapping in Lean Healthcare”

Doing 5S Right

- Concentrate on “Sort”
  - Lessons to be learned from what is present, what is absent, what is in excess
- Choose your target: Supply closet, equipment storage, medication cart, phlebotomy tray, clinic drawers (NOT your office)
- Think Visual
  - Have Participants Take Photographs
  - **not** outsiders
  - Before and After is powerful

5S Anesthesia “Shadow Board” - Before

From Virginia Mason

5S Anesthesia Shadow Board - After

“Ask the Machine”

Visual Controls

- Indicators – e.g. allergy bracelet.
- Signals – audio or visual alarm in the event of an impending error (e.g. CPRS medication alert)
- Physical Controls – e.g. specific adaptors for oxygen vs. medical air

Visual Controls – Examples

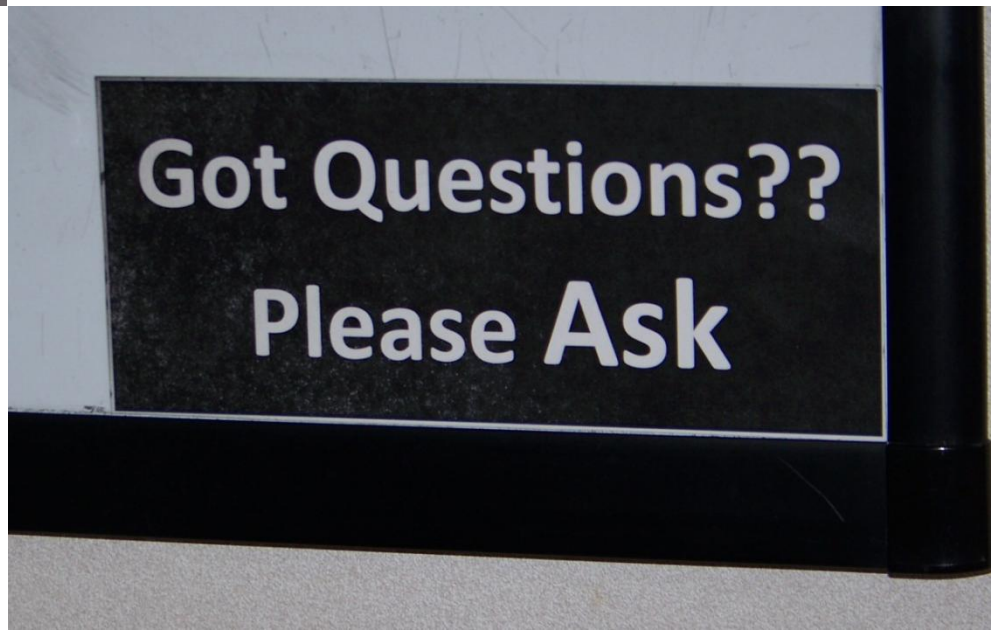
NHS Red Tray Pathway

Three day “red tray” for patients with following risk factors:

- Patients with a nutritional screening score of between 11 and 14.
- New patients to wards (especially if undernourished)
- Concern by the family regarding patients nutritional intake, or for those who may have memory problems (Alzheimer’s / Dementia)
- Patients who are slow to finish their meals or need encouragement
- Nausea / Vomiting
- Swallowing problems
- Patients with physical / mental disabilities
- Those who need assistance with eating and drinking

Visual Controls – Examples

VA Bedside Care Collaborative



VA Hospital Date: Author:

1. TEAM/AIM: Define the problem

2. MAP: Evaluate current state

3. MEASURE: Identify operational barriers and failure modes in the current process

4. CHANGE: Improve systems

Create a future state process by applying Lean techniques to eliminate operational barriers and failure modes

5. SUSTAIN: Sustainability strategy

Create a process control strategy – a strategy for insuring long term sustainability and spread adoption

1. **TEAM/AIM:** Define the problem

Fill in the Problem Definition

- What is the standard or desired level of performance?
- What is the current level of performance?
- What is the current performance gap?
- What is the extent of the impact/pain?

2. **MAP:** Evaluate current state

Fill in the Current State Map

- Describe the current state for your assigned scenario
  - High level mapping of current state
- Summarize current state with a few brief concise statements if needed

Assign Each Step With a Value Using the Color-Coded Legend

Value Legend

- Value Adding (VA)
- Non-Value Adding Nec. (NVAN)
- Non-Value Adding Unnec. (NVAU)

Add Time and Distance Required by Each Process Step to the Current State Map as Applicable

3. **MEASURE:** Identify operational barriers and failure modes in the current process

Quantify Value, Non-value and Waste in Current State

Current State Value	Current State Time /Distance
VA: ___ Steps	_____ sec. total time for routine orders
NVAN : ___ Steps	_____ sec. total time for STAT orders
NVAU : ___ Steps	_____ total steps traveled

Add Primary Barriers/ Waste

Add Root Causes for Primary Barriers/Waste

4. **CHANGE:** Improve systems

Create a future state process by applying Lean techniques to eliminate operational barriers and failure modes

- **Fill in the Future State Map**
- **Assign Each Step With a Value Using Value Legend**
- **Add Time and Distance Required by Each Step**
- **Quantify Value and Non-value in Future State**

Future State Value	Future State Time/Distance
VA: ___ Steps	_____ sec. total time for routine orders
NVAN : ___ Steps	_____ sec. total time for STAT orders
NVAU : ___ Steps	_____ total steps traveled

- **Quantify Impact of Improvements**
  - % ↓ process steps
  - % ↓ distance traveled
  - % ↓ required time
  - % ↓ NVAN and NVAU steps

5. **SUSTAIN:** Sustainability strategy

Create a process control strategy – a strategy for insuring long term sustainability and spread adoption

Give high level summary of sustainability and spread plan

Healthcare Organization Date: Author:

1. **TEAM/AIM:** Define the problem

Objective:

- Standard or desired level of performance
- Current level of performance
- Performance gap
- Extent and impact of current performance

Tools: *Use the tool(s) that works best for project focus*

- Data specific to project focus
  - Displayed in charts, graphs, tables
- Pictures
- Least amount of words as possible

2. **MAP:** Evaluate current state

Objective:

- Describe the current state in the most measurable terms

Tools: *Use the tool(s) that works best for project focus*

- Process Flow Chart or Value Stream Map
- Value Mapping
- Pictures
- Measurement of time and distance required by current process
- Detailed data on current performance/practice
  - For adverse events, include current
    - Preventive practices and procedures
    - Practices and procedure if adverse event occurs
      - Use charts, graphs, maps

3. **ANALYZE:** Identify operational barriers and failure modes in current process

Objective:

- Identify primary barriers/failure modes stopping current process from achieving goal or desired level

Tools: *Use the tool(s) that works best for project focus*

- Gap Analysis
- Hazard Analysis
- Brainstorming
- Affinity Diagram
- Multi-voting
- Risk/Volume Grid
- Opportunity Prioritization Matrix
- Root Cause Analysis

4. **CHANGE:** Improve systems

Objective:

- Describe the future state measurable terms

Tools: *Use the tool(s) that works best for project focus*

- Process Flow Chart
- Brainstorming
- Multi-voting
- Impact/Effort Grid
- Implementation Plan
- Value Mapping
- Test of Change Worksheet
- Value Stream Map
- Affinity Diagram
- Solution Prioritization Matrix
- Failure Modes Effect Analysis Plan
- Pictures
- Measure time/distance required by Future State

5. **SUSTAIN:** Sustainability strategy

Objective:

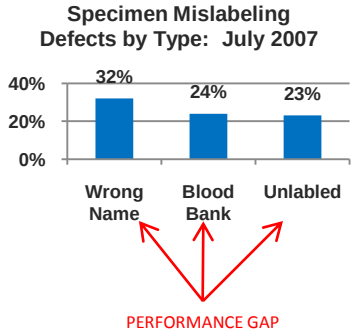
Create strategy for insuring long term sustainability and spread adoption

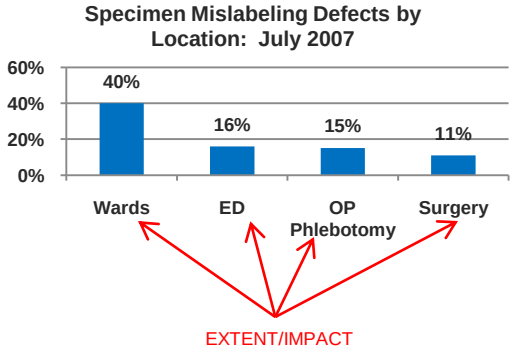
Tools: *Use the tool(s) that works best for project focus*

- Control Plan/Metrics
- Sustainability and Spread Worksheets

VA Hospital | Date: | Author:

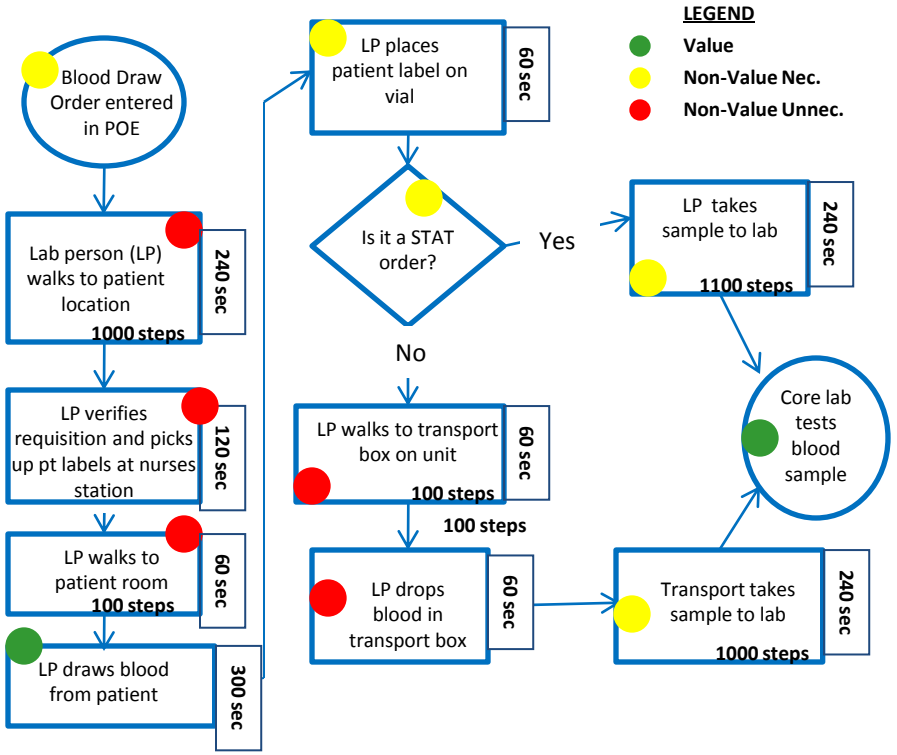
1. TEAM/AIM: Define the problem





- The standard/desired performance is = 0 specimen collection defects
- Current mislabeling defect rate ranges between 5 – 46/10,000 specimens collected (4 – 5 sigma)
- Resulting in unnecessary delays in patient treatment and may lead to wrong treatment
- Loss of revenue

2. MAP: Evaluate current state



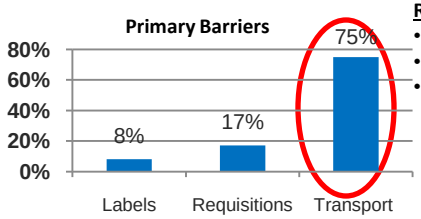
3. MEASURE: Identify operational barriers and failure modes in the current process

Current State Value Assessment

- Value = 2 steps
- Non-Value Nec. = 5 steps
- Non-Value Unnec. = 5 steps

Current State Time /Distance Assessment

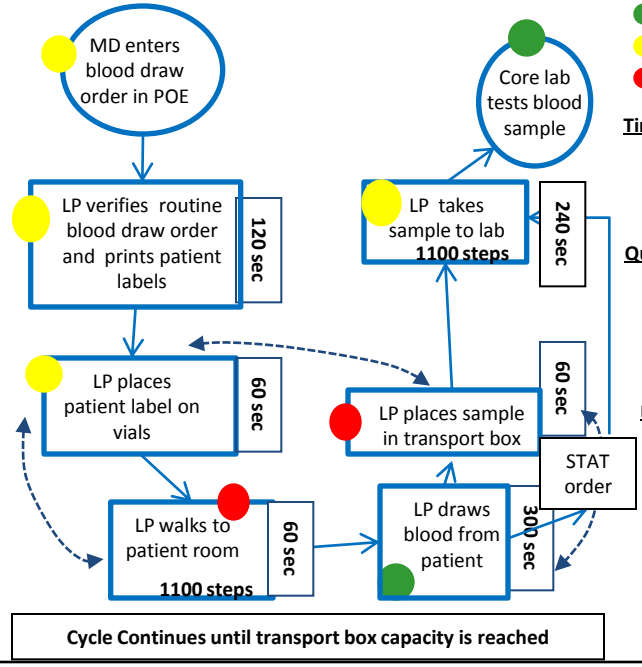
- 1,140 sec. total time for routine orders
- 1,020 sec. total time for STAT orders
- 3,100 steps traveled



Root Causes

- No process for assigning responsibility for transport
- Transporters have competing priorities
- Duplicative, error prone processes for order entry, requisitions, and patient labels:
  - Unit Sec enters MD orders in POE, and write requisitions
  - Unit Sec manually prints patient labels for vials

4. CHANGE: Improve systems



Value Assessment

- VA = 2 steps
- NVAN = 6 steps
- NAVU = 2 steps

Time/Distance Assessment

- 900 sec. routine order
- 840 sec. STAT order
- 2200 steps traveled

Quantified Improvement

- 33% ↓ process steps
- 29% ↓ distance traveled
- 21% ↓ routine order time
- 18% ↓ STAT order time

Necessary Changes

- MD Enters Orders in CPOE
- LP reviews order, prints patient labels, prepares vials prior to leaving lab
- LP transports all specimens

5. SUSTAIN: Sustainability strategy

- Process Owner is the lab director, phlebotomy team developed future state and plan
- Daily monitoring of metrics by phlebotomy team working each day.
- Monitoring results are posted on information board in full view of lab staff in laboratory
- Progress report to Management Team and Project Sponsor at 3 months, 6 months, and 12 months
- Project Team storyboard presented at corporate conference and staff have been asked to present the project to the multi-hospital laboratory best practice council

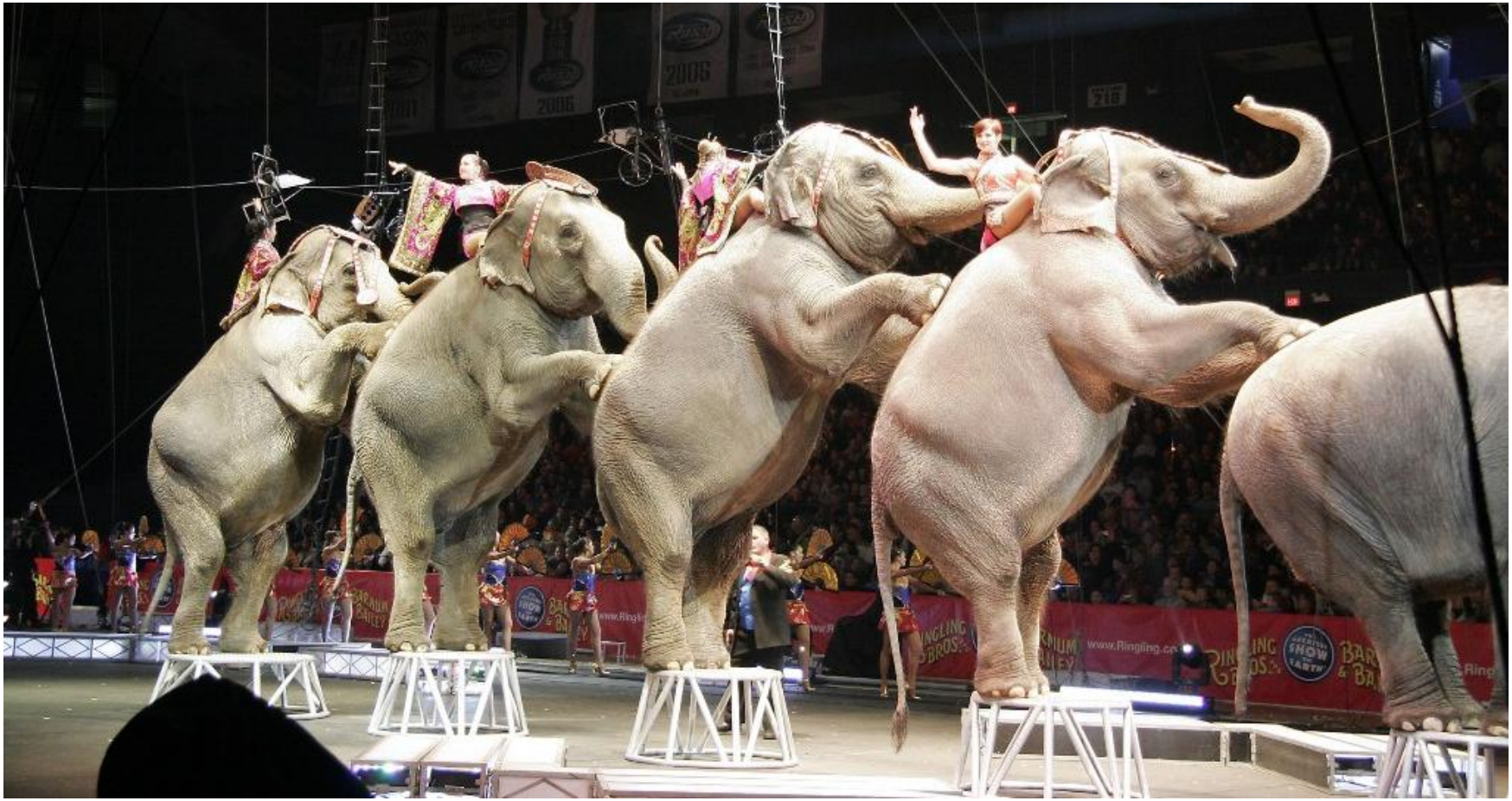
Rapid Process Improvement Workshop (RPIW)

- Intensive, multi-day experience
- Team “owns” the process
- Frequent exchange with leadership
- All phases of change process addressed
- Significant time for testing initial changes – implementation is key

Standard Work

Taiichi Ohno: “without standards there is no improvement”

- Means of codifying, and disseminating, best practices
- Helpful transition out of early tests of change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www.Ringling.com

Standard Work

Tools:

- Clear understanding of the process
- Uses Protocols, checksheets, “bundles”
- Employs visual controls

Examples:

- Virginia Mason: Handwashing technique standardized across all employees

Why?

Eliminate Waste
Validated Industry Improvements in Cost Efficacy*

Improvement	*Gains*
Quality (Defects Reduced)	50-90%
Space Reduced	35-50%
Lead Time Reduced	50-90%

Recoverable Waste in Healthcare
~35%

Wallace and Savitz J Eval Clin Practice (2008)

* IHI Going Lean in Healthcare

RPIW – Example
Bar Code Medication

- The Evidence:
  - IOM – Medication errors → 7,000 deaths annually
  - FDA – Barcodes → 500,000 ↓ in adverse medication events over 20 years
  - VA – 3.7% of IP medication administrations are “Five Rights” violations (VA data)
  - Only 1.2-7.7% of adverse events and medication errors are reported (Vicente, 2003)
  - BCMA reduces medication errors by:
    - 86% (Johnson, et al, 2002)
    - 71% (Puckett, 1995)
- BCMA introduced in VA to reduce medication errors in 1999

Bar Code Medication Healthcare Facilities

- The Evidence:
  -
  -
  -
  -
  -
- BCM

Current State Analysis: Bypassing is endemic

- At one VA:
  - 94 incidents since 10/2002
  - 10/13 aggregate RCA related to BCMA
- VA Study*:
  - BCMA bypassed 47% of time on acute patient wards
  - BCMA bypassed 92% of time on long-term care wards

* Rogers, Patterson, Render, Woods, Cook, Ebright, VA Getting at Patient Safety (GAPS) Center

Bar Code Medication Healthcare Facilities

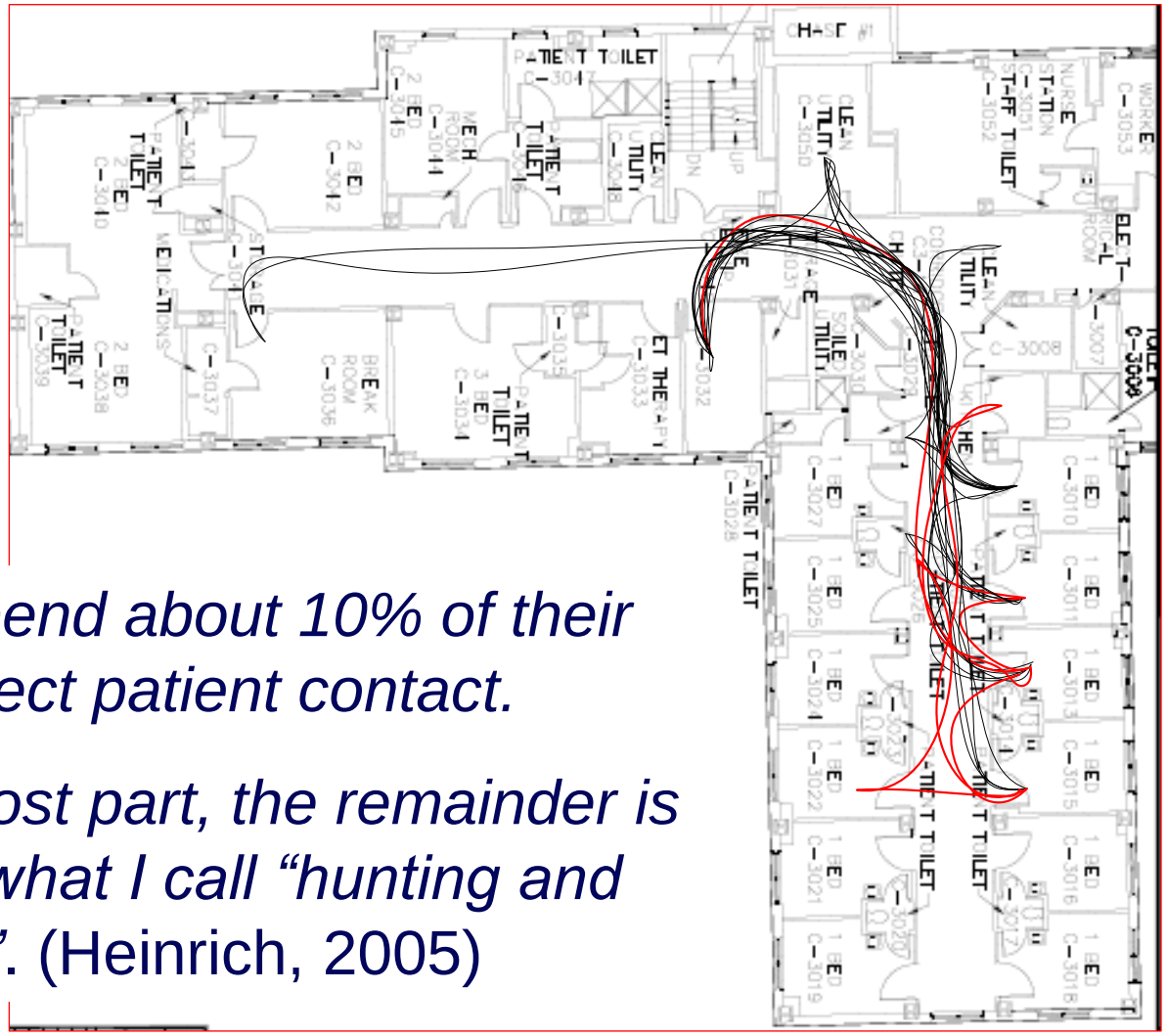
- The
  -
  -
  -
  -
  -
- BCM

Prior Interventions at one VA:

- Wristband printers replaced
- Increased number of laptops
- CAC-BCMA Coordinator created and filled
- Missed Medication and PRN Reports (auto print)
- LR/NS Bolus stocked on floors
- No more D5W on floors
- Removed barcodes from patient labels
- I-Carts

Problem Persists; Lean Healthcare RPIW Chartered

BCMA Bypass Analysis

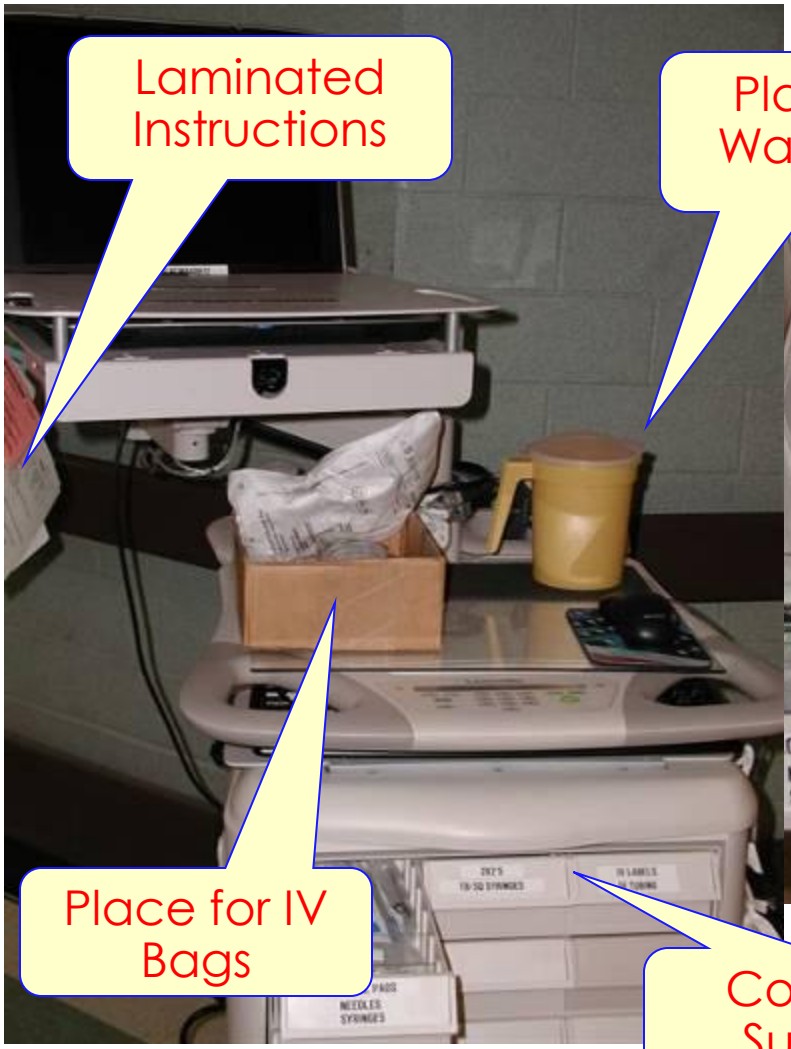


Nurses spend about 10% of their time in direct patient contact.

For the most part, the remainder is spent on what I call "hunting and gathering". (Heinrich, 2005)

Med/Isolation Carts – Current State

BCMA Cart – Post 5S Mock-up



BCMA Cart – Post 5S

Baseline / Outcomes Data

	Baseline	Post-RPIW
Distance traveled to pass meds to one patient	181	33
Number of attempts before med pass complete for one patient	3.3	1.0
Totals log-ins per patient med pass	10	3
Total time to pass meds to one patient	18	3

Time saved for other patient care activities = 15 min x 100 ADC x 3 shifts x 365 = **27,375 hours per year (~16 FTE)**

Baseline / Outcomes Data

Distance traveled to one patient	10	3
[illegible] to one	18	3

A minute here, a minute there equals big savings:
16 FTE ~ $1 million in salaries

Time saved for other patient care activities = 15 min x 100 ADC x 3 shifts x 365 = **27,375 hours per year (~16 FTE)**

Process Improvement: Expanding Improvement Capability

- Grant Funded
- Intensive Education Initiative – Focus on Teams/Units/*Microsystems*
- Facilitation and Coaching for Improvement Projects
- Data Support
- Office of Process Improvement


I NEED TO TALK TO YOU ABOUT PROCESS IMPROVEMENT
OK. JUST FILL OUT THIS "IMPROMPTU CONVERSATION PROPOSAL" FORM
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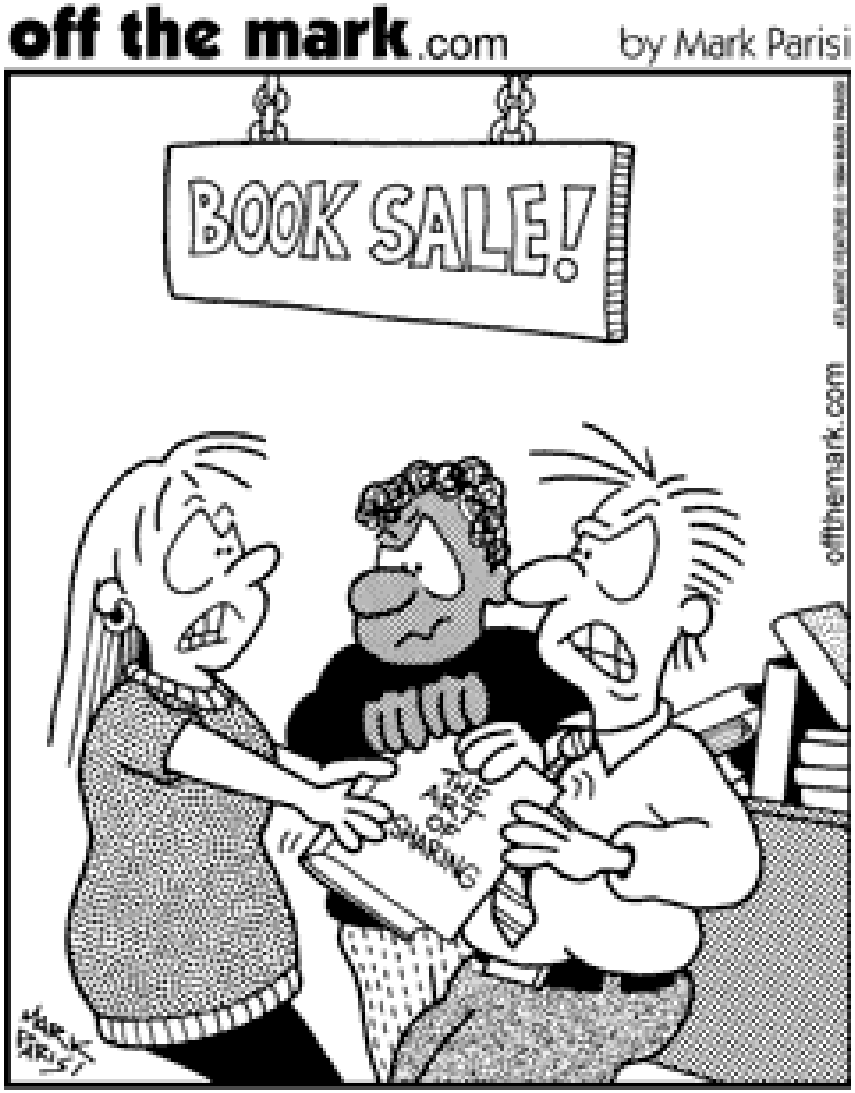
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